

# Technology Profile as a Managerial Intelligence Service

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## Abstract

Managerial intelligence is a tool supporting the decision making process which stems from the assessment of a macro context of qualitative research and from the different meanings of the word intelligence, as well as from the existing links between management and information sciences. The work is framed by the qualitative paradigm and is methodologically based on the analytical induction, the systems approach, the research – action and the triangulation of information and researchers. The case study is characterized by the discovery of new contents for the technology profile and provide an integration way for the qualitative analysis of information so as to increase the added value of managerial intelligence services. The technology profile –as a new service among the strategic profiles provided today by Consultoría BioMundi– can be included in the portfolio of products and services and at the same time can be considered as a complement of other services such as technology assessment, technological surveillance and strategic prospect.

## Keywords

*Managerial Intelligence; Qualitative Analysis of Information; Decision Making; Technology Profile Service; Science and Innovation Management; Consultoría Biomundi*

## Introduction

There is a very narrow relationship between management and information sciences, but also among the former and "...information management, computing sciences, managerial intelligence and knowledge management. Managerial intelligence and knowledge management are in need of information management in as much as: resources, methods, systems and services, and of computing sciences in as much as tools. At the same time, managerial sciences are supported by managerial intelligence and knowledge management in order to facilitate the

improvement of organizations' performance [Orozco, 2009]."

BioMundi was established on 1992 with the aim of providing information products and services featuring a high added value for supporting the decision making process in the emerging Cuban medical-pharmaceutical and biotechnological industries. These products and services expanded later to other sectors of the national economy and in this way BioMundi became the pioneer of Managerial Intelligence (MI) in Cuba.

There is not a universally accepted definition of MI –as it is the case with other types of intelligence– but to the effects of this article Orozco's definition which was chosen: "A set of methodologies, procedures and tools in order to collect, analyze and disseminate data allowing to obtain, in a systematical and organized way, relevant information on the external environment and the internal conditions of the organization for supporting decision making and the tactical and strategic course through ethical means" [Orozco, 2001], because this definition has a more comprehensive scope and matches BioMundi's stance since 1992.

Fig. 1 shows the conceptual frame under which BioMundi provides MI services:

- Information and knowledge management as well as surveillance are essential for MI.
- Competitive and business intelligence are parts of managerial intelligence and therefore, the MI may need studies of competitors or of the technologies for the management of the business internal information, but this relationship is not bidirectional: initiatives regarding business intelligence or competitive

intelligence do not necessarily mean that the organization is using MI.

- MI products and services can be used for organizational intelligence, but MI is much more, because it is directed towards the creation of internal capacities and the continuous learning at exchange spaces inside the organizations.
- Economic intelligence is “the combination of all of the coordinated measures of collection, processing, distribution and protection of valuable information for economic sectors and can be obtained through legal means. It is aimed at providing decision makers at companies or government institutions the necessary knowledge to understand the environment and adjust individual or collective strategies according to knowledge acquired” [Clerc, 1997].
- Prospect benefits from the outputs are obtained through an effective information and knowledge management, and from the added value generated by any single intelligence, a group, or all of them.

It should be noted that the terms surveillance and prospect are not accompanied by the adjective technological because that will reduce the range of application of these tools.

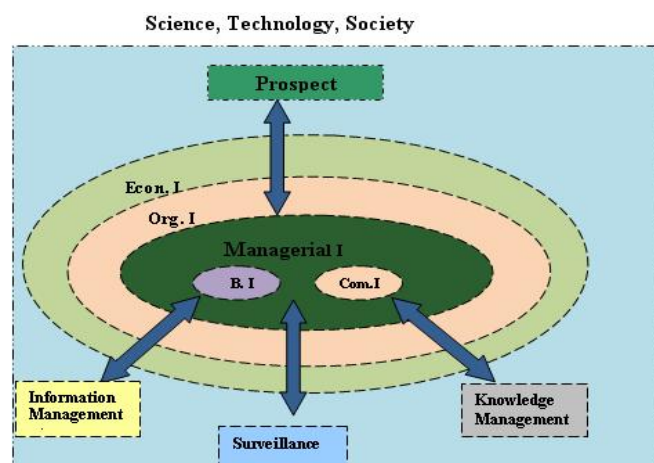


FIG. 1 RELATIONSHIP OF MI WITH OTHER USEFUL TOOLS FOR THE DEVELOPMENT OF SCIENCE, TECHNOLOGY AND SOCIETY

Source: 10th Brazilian Workshop on Competitive Intelligence and Knowledge Management [Más, 2012]

In this context, it is important to establish indicators in order to assess the aspects contained by MI [Sené, 2003], as well as its use for the assessment of research and development (R&D) [Sánchez, 2003] or science and innovation projects [Más, 2009].

Legend: Managerial I – managerial intelligence  
B.I. – business intelligence  
Com. I – competitive intelligence  
Org. I – organizational intelligence  
Econ. I – economic intelligence

Among the typical MI services we have: strategic profiles, market researches, trend studies, strategic studies, benchmarking studies and the identification of competitors' hidden potential.

Their purpose is to provide new elements to identify new business and opportunities, introduce or reject a technology, make investments in new markets, face a new legislation, perform strategic planning and so on [Maynegra, 2012].

The stages, generally accepted, for carrying out these studies foreseen in the portfolio of products and services of BioMundi, are three:

- Information identification, search and retrieval.
- Information processing.
- Analysis and interpretation.

It is worth noting that BioMundi has performed 628 information services and 462 of MI.

The MI services featured a gradual increase during the first years of work of BioMundi which was sustained until 2000 and then began to decrease significantly until 2004 to increase again in 2006 by almost three times [Maynegra, 2012].

### Strategic Profiles as Case Studies of the Qualitative Research

Denny (1978) defined the case study as “a completed or intense examination of a facet or issue or perhaps the developments taking place in a geographical frame across time”. Other authors considered it as the examination of a case in progress [MacDonald, 1977] or as a particular way of collecting, organizing and analyzing data [Patton, 1980]. These were other non quoted definitions agreeing that the cases study was an investigation process: detailed, comprehensive, systematical and deep examination of the case of interest.

A case can be a person, an organization, a teaching program, a collection, a particular event or a simple deposit of documents. The only demand is that it possesses some physical or social limit conferring it entity [Rodríguez, 2004]. It is considered that the MI services meet this requirement.

Rodríguez and his colleague (2004) established two types of case studies: the single and the multiple one. For the definition and practice of the strategic profiles in BioMundi, it was considered that these ones were classified as a single case study, most representative modalities of which are shown in Table 1.

TABLE 1 FEATURES OF THE SINGLE CASE STUDY

Type	Modalities	Description	Purpose
The single case study	Historical - organizational	It deals with the evolution of an institution.	Representing
	Observational	It rests on the participative observation as the main technique for data collection.	

SOURCE: ADAPTATION FROM RODRÍGUEZ (2004)

If the intention of the case study is to represent - as considered adequate for the strategic profiles - then at factual level, a profile of the case is constructed; at interpretive level, meanings are synthesized (the strategic profiles in BioMundi are considered to be analytical-descriptive studies); and at evaluative level, the case is portrayed as it is observed in Fig. 2.

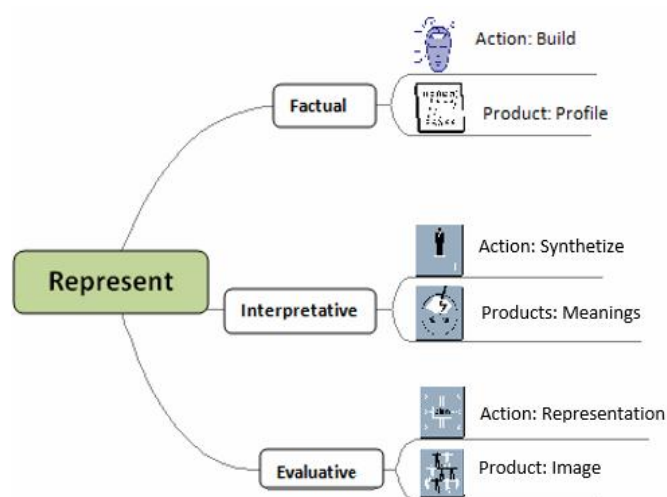


FIG. 2 THE PROFILES AS CASE STUDY OF THE QUALITATIVE RESEARCH

Source: Adaptation from Rodríguez (2004)

Then, to the effects of the MI, these levels of the strategic - profile case study help the decision making process. So, for the entity interested in the study, the action level is incorporated from the conclusions and recommendations done in the strategic - profile case during the representation in the evaluative level.

## The Strategic Profiles as Consulting Services in BioMundi

Maynegra (2012) identified the classification used by the Institute of Scientific and Technological Information (IDICT, Spanish acronym) -to which BioMundi belongs- for strategic and organizational consulting services. In this way, "the strategic consulting service was aimed at providing high added value services from the identification, reception, processing and the analysis of information published in sources of local or remote access , which allowed the client to solve problems and make strategic decisions in any sectors. For this, the consultant must be able of identifying the key information sources meeting the requirements of the research".

This definition allowed the author to identify the strategic profiles as strategic consulting services, thanks to their high added value where information identification, reception, processing and analysis were combined for decision making at any organization [Maynegra, 2012]. In this way, the qualitative analysis was included in the stage of information analysis, characteristic of this kind of services.

The direct precedent of the strategic profile service in BioMundi was the creation and edition of the BIOTEC directories, published in 1989, 1990, 1992 and 1994 in hard copy and some of them in CD - ROM. Thus it went so far as to prepare more than 8,000 brief profiles of organizations of the biotechnological and medical-pharmaceutical sector from 132 countries for the above mentioned directories [Fleitas, 2006].

BioMundi is provided with the necessary procedures for making different profiles such as: country, sector, organization and personality [Yin, 1984].

We keep on developing the diversification of strategic profiles, in relation to the context of the socio-economic development policy of the country and the existence of other consulting services potentially useful for BioMundi according to its strategic planning.

### Case Study: Technology Profile

A single case was chosen, as design strategy for the qualitative research, within the cases study, because the technology profile met the requirements established by Yin (1984):

1. It allows confirming, changing, modifying or extending the knowledge on the selected

technology.

2. It is single in character as a type of strategic profile.
3. It reveals the technology from the content of the profile, agreed upon by the project staff.

In the context of the MI, the single case study had a wider scope, because the consultation of structured and non structured sources of the external environment (competing technologies, for instance) was incorporated in the design and execution of the profile, as well as of the internal environment of the technology for which the content of its profile was designed and executed. Fig. 3 shows the design applied.

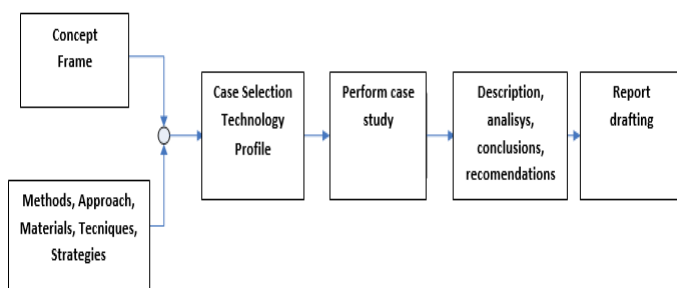


FIG. 3 DESIGN OF THE CASE STUDY

Source: Adaptation from Rodríguez (2004)

This type of design was selected in line with Stake (1994, 1995), who affirmed that this should be an opportunity to learn due to the easy access to it. Concepts, methods, tools, persons, sources and processes related with the MI were mixed. It was prepared during the execution of a service project. The author was always present at every moment so as to guarantee the quality and the credibility of the results. (Más, 2013)

#### ***Technology Profile as a Result of the Research - Action***

During the research- action, some elements conditioning the objectivity of the work came together in the information contents of a new strategic profile of technology. These were the following:

- ⇒ Patterns of the scientific and technological development identified by Fernández (1997).
- ⇒ Features of the new economy - not so new anymore - expressed themselves in:
  - Celerity of the change in the technologies that serve as specific support, such as mobile phones, Internet and the genetic engineering).
  - Globalization allowing the presence of

products or services in the biggest number of possible markets with short notice.

- Improvement of the economic culture of the consumer or client, who increasingly demands higher levels of excellence from the product or service, therefore preventing that company's deficiencies be transferred to his/her offer.
  - The (intangible) knowledge and information as the elements adding more value to the product or service [Castro, 2004].
- ⇒ Project for the "Assessment of Technological Needs in front of the climate change" [CUBAENERGIA, 2012], first of its type in Cuba, whose main objective is: to identify, evaluate and arrange - by priority - technological assets allowing the adaptation to the climate change and contributing to the sustainable development. The technology options identified shall support routes of low vulnerability and therefore science and technology breakthroughs should be monitored.
- ⇒ A study on the satisfaction of clients' needs, performed by Maynegra (2012), allows us to know those clients:
- Use the consultancy reports to decide on continuing or not a research line, on the production of a product or service, to get information about interest aspects and to decide on the commercialization of a product or service.
  - More than 70% of inquired people agree that the services most demanded are the researches of: market, trends and the informative compendia. Strategic studies (54%) also rank among the first.
  - They identify the scientific, technological and the commercial information as the most demanded, followed by information on regulations and management. The economic one ranks in the last position.
- ⇒ Among MI products, the strategic profiles were the most requested during the period 1994 - 2010, representing 48% of the total. However, although they considered that scientific technological, commercial, regulative, managerial and economic information were of interest for the clients, the vision of their utility decreased.

The proposal of the technology profile will necessarily influence the increase of the importance of the economic information for making technological decisions; as well as for choosing this kind of service, according to the historical and socio-economic context in which it emerges in order to diversify the portfolio of products and services of BioMundi.

This way, the aspects to bear in mind for the elaboration of the technology profile - in a first approach - are shown in Table 2.

As in the case of the profiles already established in BioMundi, the contents of the technology profile will increase or decrease; they will be more general or specific, deeper or superficial, in relation to the interest of the client.

TABLE 2 ASPECTS PRESENT IN A TECHNOLOGY PROFILE

Section	Content
Name	Official name of the technology
Description	Description of the technology
Sectors	Sectors benefiting most with the technology
Leaders	Leading companies in the market
Products	Products containing the technology
International classification	If the technology or sector using it classify or not as high technology
Acquired rights	Industrial property rights acquired: a) Distinctive features. b) Existence or not of patents. If they exist: classes where they express themselves (quantities of patents, thematic focal point, relation between deposited and revealed patents), age of the technology, holders; relation among inventor, petitioner and holder; leading countries, cooperation among entities, scope of the technical solution, distinctive elements of the proposed solution, legal rights on the use of the technical solution, niches for future patents, among others.
R&D trends	R&D trends, cooperation among researchers and research centers.
Commercial trends	Commercial trends, competing technologies, prices, raw materials and inputs suppliers, producers.
Transference	Technology transfer. If done, identify countries and sectors.
Perception	Perception of the technology.

SOURCE: MADE BY COSSÍO AND MÁS (2013)

## Conclusions

1. The case study was characterized by the discovery of new contents for the technology profile.
2. The research - action and the use of the cause

and effect diagram, as well as the mental map contributed to the qualitative analysis of information for the elaboration of the technology profile of laser sintering titanium.

3. The technology profile can be included in the portfolio of products and services of BioMundi, Being considered as a complement of other services: evaluation of technology, technological surveillance and strategic prospect.

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She graduated in pharmaceutical sciences from Havana University in 1986, and in business intelligence, in 2008. She has taken several postgraduate courses related to pharmaceutical sciences and business intelligence. Her working experience includes the following: Instructor at the School of Chemistry Pharmacy of "Marta Abreu" Central University (1986-1989); drug store attendant (1989-1995) at Kurhotel Escambray hospital in Topes de Collantes; Head of Medicinal Plants Department (1995-2002), also a Kurhotel Escambray, specialist in information (2003-2006), at Biomundi Consulting Office of the Institute of Scientific and Technological Information (IDICT, Spanish acronym), where, at present she is the head of the Department of Business Intelligence Services, a position she has held since 2006.

In the Biomundi Consulting Office, she has accumulated experience in the elaboration of different consulting studies, such as: trends and market studies and strategic profiles. She has been a lecturer at national and international workshops and events on business intelligence, information sciences and intellectual property. She is co-author of the Chapter 4 "Information analysis for business intelligence" of the book "Business intelligence. What and how?" IDICT, Havana, 2009. She was the professor of the course "Quantitative analysis of information for business intelligence", which used to be part of several editions of the diploma and of the specialty in business intelligence courses. She has also taken part in consulting and technology transfer services to foreign and Cuban institutions. She has been a full fledged member of several scientific committees established for different events organized by Biomundi Consulting Office and the IDICT.